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ABSTRACT

Kindergarten teachers are not receiving instruction in computer literacy, and the kindergarten curriculum does not include instruction in use of computers. A practicum project addressed the problem of bilingual (Spanish-English) kindergarten teachers who did not know how to use computer word processing programs. Major goals of the project were to increase teachers' computer literacy through their: mastery of word processing skills; creation of school-related documents, with graphics; learning of computer maintenance; and mastery of and comfort with computers for application in their teaching and classroom management. The computer instruction and training program that was designed and implemented for the project concentrated on increasing the word processing skills of the bilingual kindergarten teachers using instructional and educational technology. Twelve kindergarten teachers participated in the program. Analysis of evaluation data revealed that the bilingual kindergarten teachers understood basic computer technology, and achieved the goals of the project. (Nine appendices include a copy of the faculty survey questionnaire, computer literacy pre- and posttest, a computer care and maintenance evaluation instrument, and samples of teachers' work. Contains 25 references.) (AA)

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Design, Development, and Implementation of an Instructional Program for Kindergarten Teachers to Increase Their Basic Computer Skills through Word Processing Training

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by

Hernando Vergara

Cluster 60

A Practicum I Report Presented to the
Ed.D. Program in Child and Youth Studies
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA SOUTHEASTERN UNIVERSITY

1995

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Approved:

6-20-95
Date of Final Approval of Report

Georgianna Lowen, Ed.D., Adviser

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ABSTRACT

Design, Development, and Implementation of an Instructional Program for Kindergarten Teachers to Increase Their Basic Computer Skills through Word Processing Training. Vergara, Hernando, 1994: Practicum Report, Nova Southeastern University, Ed.D. Program in Child and Youth Studies. Elementary Education/ Instructional Design/Instructional Technology/Educational Technology/Computer Education/Teacher Education/Computer Skills Training/Bilingual Word Processing Skills

This practicum addressed the problem that bilingual (Spanish-English) kindergarten teachers did not know how to use computer word processing programs. Kindergarten teachers have not received instruction in computer literacy, and the kindergarten curriculum does not include instruction in use of computers. Major goals were to increase teachers' computer literacy through their mastery of word processing skills; teachers' creation of school-related documents, with graphics; their learning of computer maintenance; and mastery of and comfort with computers for application in their teaching and classroom management.

The writer designed and implemented computer instruction and training which concentrated on increasing the word processing skills of the bilingual kindergarten teachers through the application of instructional and educational technology. The writer developed a practicum implementation guide (practicum manual) that was distributed to the students for use throughout the implementation of this program.

The results of the practicum were positive. Analysis of the data revealed the bilingual (Spanish-English) kindergarten teachers understood basic computer technology, learned how to use a computer and a word processing program, created documents, mastered maintenance, and planned to use their new knowledge in their classroom teaching.

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Chapter I

INTRODUCTION

Description of the Community

This practicum was conducted and implemented at an academic center that is part of a community college campus and is located in the southeastern section of the United States. Once a densely populated and predominantly White area, within a very few years this community has become increasingly ethnically diverse.

Most of the people in the neighborhood are immigrant home owners of middle and working class income. Some families, many of whom are elderly persons who are on Welfare and retired, live in low-rent, government- subsidized apartments. Other, younger families are also on Welfare and in financial straits. Children in these families are generally at a disadvantage.

With the large amount of immigration, socioeconomic problems, and poverty, the children's performance as students is often affected. Poor home support for academic success, lack of positive role models,

and little self-esteem are all problems that can lead to low achievement and failure among these students.

Often the schoolteachers in these settings come from similar backgrounds and are affected by this negative composite. Thus, the teachers may not be able to support the students positively or be good role models themselves. These teachers have often not kept pace with the latest teaching methods, especially in the application of today's technology to education. Specifically, computer literacy is largely lacking from these teachers' methods of instruction. This lack seems a disservice to the teachers, the community, and especially the students.

Writer's Work Setting and Role

The campus at which the writer teaches is the third largest unit of a multi-campus institution. This campus has a population of approximately 4,000 students, a large proportion of whom are multicultural low- and middle- socioeconomic status students. This campus is the largest bilingual English-Spanish institution in the country which offers undergraduate education; it also includes a demonstration school that serves children from kindergarten through

not including the demonstration school, is as follows: 72% Hispanic, 14% White non-Hispanic, 13% Black non-Hispanic, and 1% other.

The writer presently serves as instructor of computer technology in the Foreign Languages Department. Computer students of all ages and occupations come from various campus departments, including faculty. Students are multilingual; approximately 95% are computer illiterate, and the remainder possess varying levels of literacy. Many of the students are teachers of different grades.

In a three-semester unit, the writer delivers instruction to approximately 40 students. He is responsible for teaching these students computer applications, use of technology tools, and facility in language translation applied to their individual occupations and needs.

The writer plans instruction and "hands-on" activities, incorporates teaching strategies, and utilizes the most appropriate training materials. In addition to carrying out instructional technology duties, the writer serves as liaison with the demonstration school and other campus faculty in related fields, and assists in the production of training tools.

As the sole instructor of this computer-assisted foreign languages program, the writer had the powerbase to implement this practicum without special permission and in accordance with his sole specifications. Bilingual (Spanish-English) kindergarten teachers with no basic word processing skills were the target population of this practicum. Word processing training for kindergarten teachers to learn to use basic computer technology connected naturally with the computer-assisted foreign languages program curriculum. All instructional resources were allocated and proper administrative procedures were followed. Additional materials or approval were unnecessary for implementation of this practicum.

Chapter II

STUDY OF THE PROBLEM

Problem Description

The problem addressed by this practicum was that bilingual (Spanish-English) kindergarten teachers did not know how to use computer word processing programs. Bilingual kindergarten teachers require basic computer skills to succeed as effective teachers, and to properly prepare their students to succeed in an increasing technological environment. At present, computers are not used by kindergarten teachers in the county school system, nor are teachers required to possess computer skills. Kindergarten teachers have not received instruction in computer literacy. Moreover, several of the teachers in the practicum had earned their degrees in foreign countries where they did not receive computer training. They experienced "computer anxiety," that is, believing that if they made an error they would damage the computer.

The kindergarten curriculum does not include instruction in use of computers. No in-service or certification courses are required for

the teachers to update their skills. Upon the writer's examination of the county teaching objectives, it was clear that word processing skills are not required for kindergarten teachers. Therefore, the subject has not even been addressed; there has been no professional "pressure" to teach the teachers these skills. Furthermore, teachers themselves seem resistant to learning, either because of "computer anxiety" or insufficient awareness of the importance of computer literacy for both themselves and their students. These may be major reasons why computer literacy or computers in the curriculum are not presently stressed in the kindergarten.

However, the kindergarten students are strongly affected. With the burgeoning use, accessibility, and necessity of computer technology in our society, kindergarten is not too early for teachers to introduce their students to the use of computers. But of course the teachers themselves must be conversant in computer use. Thus, the problem addressed by this practicum is that bilingual (Spanish-English) kindergarten teachers do not know how to use computer word processing programs. Through several instruments (Appendices A-I), this practicum traced the teachers' progress from complete lack of

computer literacy to facility in using computer word processing programs and production of computer-generated documents.

Problem Documentation

Evidence of the problem was supported after 12 kindergarten teachers were surveyed in a Faculty Survey Questionnaire (Appendix A) designed and administered by the writer. All 12 of the teachers reported that they had no previous computer training and did not know how to use word processing. These 12 teachers were not familiar with educational computer programs and did not have access to the computer laboratory. Table 1 summarizes these results, especially questions 7, 9, 10, 13.

As Table 1 also indicates, these teachers, if given the opportunity, would use computers as a teaching tool, believed in using computers in education, and felt they needed computer technology training (questions 11, 14, 16). Thus, from the writer's observation and interviews conducted with these 12 teachers, it was apparent that they were ready and willing to receive the training. The writer therefore selected these kindergarten teachers for this practicum.

Table 1

Faculty Survey Results

Questions	Subjects												Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	Y	N
1. Grade	K	K	K	K	K	K	K	K	K	K	K	K	12	0
2. Student's age	5	5	5	5	5	5	6	6	5	5	5	5	-	-
3. Years of experience	3	4	3	2	4	4	3	10	4	20	7	25	-	-
4. Bilingual?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	12	0
5. Studied outside U.S>?	Y	Y	N	Y	5	Y	Y	Y	N	Y	Y	Y	10	2
6. Technology relaxed?	Y	N	N	N	N	Y	N	N	N	Y	Y	N	4	8
7. Previous training?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
8. Computer classes?	N	N	N	Y	N	N	N	N	N	N	N	N	1	11
9. Word processing?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
10. Education programs?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
11. Computer as a tool?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	12	0
12. Classroom computer?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
13. Access to lab?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
14. Computers education?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	12	0
15. Computers available?	N	N	N	N	N	N	N	N	N	N	N	N	0	12
16. Need training?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	12

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Causative Analysis

The writer's observations and interviews with targeted kindergarten teachers and the results of the faculty survey were the determining factors in his conviction that computer curriculum is needed and welcomed as an instructional unit for kindergarten teachers. As noted, there has been no emphasis on training in such activities because they are not included in the county curriculum objectives. Computer literacy classes are not a requirement, and therefore only teachers with an interest in computers will take any courses offered. Some bilingual kindergarten teachers are reluctant to change and do not use the computer or see its possibilities for use as an educational tool.

Teachers are seldom exposed to keyboarding activities and are not taught to use basic word processing, including such functions as how to save, file, retrieve, delete, and print files. Therefore, teachers cannot relate these functions to their daily activities and those of their students, nor are they able to imagine how computer use can further the ease and efficiency of these activities.

In addition, some kindergarten teachers are apprehensive about computer technology, fearing that they will not understand or that they will "feel foolish" or fail to master the computer. As noted above, teachers also experience "computer anxiety," that is, believing that if they make a mistake the computer will be damaged. This is a concern that is groundless and can be overcome by anyone who has a desire and commitment to make computer use a reality in the classroom.

Further, the faculty survey revealed that 10 out of 12 teachers had graduated in a foreign country where they did not receive computer training (Table 1, questions 5 and 7). Computer curriculum was never required in their education or professional training. Therefore, the teachers were not computer literate enough to teach their students. In addition, in the teachers' present schools, there were no computers in the kindergarten classrooms and the teachers did not have access to the computer laboratory. For most teachers, even if they desired to become computer literate, the daily demands of the subjects and objectives to be covered generally left little time, if any, to devote to training in computer skills. And finally, because of the community setting and general low socioeconomic and

occupational levels of the families of kindergarten students, the classroom teacher was not seen as a positive role model who used computer technology as a tool in daily life. Teachers themselves did not have this self-affirming view, nor was it encouraged within the school or county.

To successfully incorporate computer technology into classroom activities requires training, commitment, and creativity. The results of the faculty survey indicated that these kindergarten teachers were willing students themselves to commit to learning basic computer technology, that is, word processing skills.

Relationship of the Problem to the Literature

According to Atwell (1985), McCarthy (1988), and Berliner (1985), lack of teacher training is the primary reason for the lack of computer use in the classroom. Presently, teachers are trained to implement a direct instruction model without computers. In light of today's escalating Information Age, this mode of instruction appears insufficient. A review of the literature to date indicated the need to implement a different strategy to improve students' academic

performance and prepare them adequately from prekindergarten forward for success in the higher grades (Brunder, 1988).

A training program in computers in education is a most valuable program for both teachers and students. Today the use of the word processor is a basic tool. Word processing programs for bilingual kindergarten teachers combined with basic computer skills would serve two vital functions. Teachers' professional competence would be improved, and mastery of computer skills would enhance their teaching strategies. In addition, computer literacy would enable teachers to provide their students with a learning tool adapted to various teaching and learning styles (Swett, 1986). Such a training program would also encourage teachers to engage in independent study and cooperative learning, emphasizing higher-order thinking skills in conjunction with their learning styles (McCarthy, 1988).

Teachers would thus have greater opportunities to work creatively using computer technology to teach basic kindergarten curriculum as well as English as a second language. Having mastered the use of the computer and the ability to create their own documents for classroom use, they would then implement a cognitive academic language learning approach. Teachers would be able to use their new

computer skills to help their students grasp and develop the basic reading and thinking skills that form the foundation of education. Teachers would thus provide a program most appropriate for their foreign-language-speaking students' needs (in the present case Spanish-speaking students). Such a program would give students the opportunity to develop their potential and more greatly ensure their ongoing academic success.

Zeigler and Jalongo (1987) found that young children would write if they were given the opportunity. These researchers also advocated that the writing should be limited to the children's experiences and imagination. However, some of the setbacks to young children's writing were the teachers' lack of training in accepting writing that was "imperfect." In addition, many parents and educators felt that if the children could not do a "perfect" job they should not even begin, because failure would be inevitable.

Calkins (1983) observed that young children often imitated adults' everyday acts of writing, such as making grocery lists, writing checks, and writing letters. These activities, she stressed, stimulated young children's early attempts to write. Often children were not given opportunities to experiment with these activities.

Clemens, Nastasi, and Swaminathan (1993) found that in schools today, computers are seen only as a method to add variety, as teaching machines rather than as an integrated part of the educational curriculum, which could help children with language-learning and writing development. Perkins (1991) suggested that teachers who continue to teach a curriculum which is disconnected from application to life outside of school do students a great harm. He also observed that colleges continued to prepare teachers in the traditional accepted method and had not taken technology and its influence on education as seriously as they should. He found that college education was comprised of rigid methods and curriculum courses, although in a broad range of areas.

Since the colleges and universities educating teachers did not assess the subjects in which to incorporate computers, very little attention or instruction was given. Teachers were not shown how to integrate computers into all subject areas, nor was there emphasis on the importance of computers. Thus, Perkins (1991) pointed out that teacher training and support by administration are essential to introduce and expand the use of computer technology in the classroom.

Some of the causes of technology deficiencies in schools are the following, as noted by McDaniel, McInerney, and Armstrong (1992): inadequate resources, an uncertain political environment, administrations not requiring computer training, and teachers not taking the risks necessary to change from old patterns of teaching. Ironically, children are surrounded by and generally absorbed in a sea of integrated technology, e.g., in computer games, which is not reflected in today's curriculum. As D'Ignazio (1990) observed, there is an uncoordinated skills approach in most classrooms to teaching computer technology, that is, if any approach exists at all.

The use of microcomputers as educational tools in the classroom from kindergarten through the college level has been evaluated and highly recommended by Chamberlin (1988). Further, significant advances in hardware and software have increased the possible applications to education, particularly for limited-English-proficient students (Cohen, 1989). A great diversity of hardware and software is currently in use in schools, either with stand-alone computers or through computer networks. Several emerging technologies have potential applications: videocassette recorders, compact disk read-only memory (CD-ROM), videodiscs, and

computers that recognize speech. There is also a variety of available software, e.g., tutorials, simulations, and games. The use of word processing thus offers a number of advantages for teaching reading and writing to students who are limited in English proficiency.

Cohen (1989) also pointed out a number of factors negatively affecting the successful implementation of technology. These include lack of appropriate software, inadequate software integration into the curriculum, lack of compatibility between hardware and software or between hardware components, lack of funding, and, most important, lack of teacher training. Among other suggestions, Cohen (1989) recommended increased student and teacher access to computer laboratories.

Milk and Mendiola-Burgess (1986) discussed issues related to the introduction of computer use for bilingual education into education programs for bilingual teachers. These issues include equity with mainstream education programs, the functions for which computers are used in the schools, differential student access to resources in the home, and addressing of preservice teacher computer anxiety. Milk and Mendiola-Burgess (1986) discussed evaluation data with the bilingual teacher in mind, with special focus on providing adequate

coverage of the full range of competencies for computer education needed by teachers within the time constraints of conventional teacher education programs.

In an extended discussion, Swett (1986) reported on how and why three schools are using computers to teach bilingual students. Based on a comprehensive review of the existing research reinforced by consultation with a panel of experts, Swett (1986) documented the impact of computers on many aspects of elementary and secondary school operation, with particular reference to bilingual education. Among the issues dealt with were the programs, literacy education, native language instruction, parent participation, postsecondary education, program evaluation, staff development, student placement, and teaching methods. Effects of computers on student academic performance and attitudes were explored in terms of background information on current school practices, and a review of the literature on the effects and effectiveness of computer-assisted instruction and computer-managed instruction. Further, projections were made of effects on students of computer use in schools.

Swett (1986) concluded that all of these issues are relevant to the implementation and maintenance of computer literacy training for

teachers in the schools, especially bilingual teachers. From his conclusions and the other literature reviewed here, there is no doubt that many schools and administrations lag in recognition of the importance of faculty computer training. Thus, this practicum addressed a necessary and basic step in implementation of computer training. This is instructing kindergarten teachers in the mastery of word processing skills.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

The following goal and expected outcomes were projected for the practicum. As a result of the program of instruction, the kindergarten teachers will produce a document in English and Spanish through mastery of word processing. The teachers will then use the computer to produce school-related documents, which will include, for example, letters, newsletters, posters, story books, and greeting cards with appropriate graphics that appeal to children. Some of these activities will be accomplished individually and others will be completed in cooperative groups. Teachers will learn to complete the activities through mastering basic word processing skills, such as how to edit, save, print, delete, and retrieve files. Teachers' edited bilingual documents will be attached to the practicum report to illustrate the activities performed. The demonstration of mastery will be the finished products, which will be displayed and shared within the practicum class as well as with other classes.

Expected Outcomes

The following objectives were expected outcomes for this practicum. These conditions were expected to prevail for the population participating in the implementation of the practicum and were designed to meet the writer's goal of facilitating solution strategies.

Teacher observation and the Faculty Survey Questionnaire (Appendix A) administered to bilingual kindergarten teachers by the writer indicated that 12 out of 12 teachers were unable to use a word processing program (Table 1, question 9). The writer's observation and interviews with these teachers also showed that 12 out of 12 bilingual kindergarten teachers had no ability to produce a document in either of their languages by the use of a word processing program (Table 1, question 7). Further, the writer's observation revealed that 12 out of 12 bilingual kindergarten teachers were unfamiliar with educational software (Table 1, question 10). Given the teachers' initial lack of competency, the following outcomes were expected.

Outcome #1

Ten out of 12 bilingual kindergarten teachers will demonstrate their ability to recognize different computer components in the mastery of basic word processing skills: to enter data, create documents; use bilingual spellers, dictionaries, and a thesaurus; and to save, print, and exit a word processing program. This outcome will be measured by the Computer Literacy Pre/Posttest and Basic Computer Literacy Evaluation Instrument (Appendices B and C).

Outcome #2

At least 10 out of 12 bilingual kindergarten teachers will create one or more documents, with graphics, in English and Spanish, by the use of a word processing program. This outcome will be measured by the Letter Evaluation Instrument and the School-Related Documents Evaluation Instrument (Appendices D and E).

Outcome #3

Ten out of 12 bilingual kindergarten teachers will become familiar with the range of educational software available to them for classroom use. This outcome will be measured by the Educational Software Evaluation Instrument (Appendix F).

Outcome #4

Ten out of 12 bilingual kindergarten teachers will perform basic computer preventive maintenance and troubleshooting. This outcome will be measured by the Computer Care and Maintenance Evaluation Instrument (Appendix G).

Outcome #5

Ten out of 12 bilingual kindergarten teachers will master and feel comfortable using and teaching use of the computer in their classrooms. This outcome will be measured by the Teacher Reaction Form (Appendix H).

Measurement of Outcomes

The measurement of outcomes of the practicum was designed to encompass several instruments and strategies. Each goal of the practicum was generated to a specific measurement tool.

Outcome #1

Outcome #1 stated that 10 out of 12 bilingual kindergarten teachers will demonstrate their ability to recognize different computer components in the mastery of basic word processing skills: to enter data, create documents; use bilingual spellers, dictionaries, and a

thesaurus; and to save, print, and exit a word processing program. This outcome was to be evaluated by monitoring the teachers' ability for recognition and familiarity with computer components through administration of a Computer Literacy Pre/Posttest (Appendix B) and a Basic Computer Literacy Evaluation Instrument (Appendix C). With the writer observing, the teachers would demonstrate knowledge of physical computer components and performance of computer functions, in both verbal and "hands-on" forms. For each teacher the writer would then enter into a log his personal observations and would keep records of the data collected at the beginning and end of the implementation period of the practicum.

Outcome #2

Outcome #2 stated that at least 10 out of 12 bilingual kindergarten teachers will create one or more documents, with graphics, in English and Spanish, by the use of a word processing program. This outcome was to be evaluated by use of two instruments of measurement. These were the Letter Evaluation Instrument (Appendix D) and the School-Related Documents Evaluation Instrument (Appendix E). Both of these instruments evaluated teachers' use of and familiarity with the computer functions

necessary to produce verbal content as well as those needed for proper graphics. These instruments also measured aesthetic quality and originality of the documents produced.

Outcome #3

Outcome #3 stated that teachers will demonstrate familiarity with educational software. This outcome entailed use of the computer for an instructional purpose by teachers loading and running educational programs. This outcome was to be measured by both the writer's observations and data collected based on teachers' performance. From these observations information to measure this outcome was to be recorded by the writer on the Educational Software Evaluation Instrument (Appendix F). This instrument assessed teachers' learning about software packages, multimedia and interactive components, and teachers' own input to the software.

Outcome #4

Outcome #4 stated that teachers will learn proper techniques for care and user responsibility in operating a computer with the basic hardware and peripheral equipment as well as techniques of "troubleshooting." Teachers' knowledge and performance were to be measured by the writer's observations and written evaluation of the

teachers' performance. To measure this outcome, data were to be entered on the Computer Care and Maintenance Evaluation Instrument (Appendix G). This instrument evaluated teachers' recognition of proper computer behavior, error messages, mastery of antivirus programs, and basic cleaning and supply replenishment techniques.

Outcome #5

Outcome #5 stated that teachers will master and feel comfortable using and teaching use of the computer in their classrooms. This outcome was to be measured from data collected from a survey instrument, the Teacher Reaction Form (Appendix H), to be completed by the teachers. This instrument was to be administered by the writer at the end of the implementation period of the practicum. The instrument solicited teachers' responses in terms of favorite and least favorite activities, reasons for their choices, and their degree of comfort with the word processor.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

In implementation of the practicum, several strategies were selected as solutions to the problem that bilingual (Spanish-English) kindergarten teachers have no basic word processing skills. Many solutions could be considered to help eliminate this problem. Individual and small group instruction, cooperative learning, and self-study are all possibilities.

Rationales for solving this problem are numerous. In the broadest terms, bilingual kindergarten teachers need basic computer skills to succeed as teachers and to properly prepare their students in an increasingly technological and competitive environment. With the range of computer programs available for even preschool children, kindergarten is not too early for teachers to gain mastery of word processing to teach their students.

In more specific terms, a training program in basic computer skills for bilingual kindergarten teachers will improve their professional

competence. Teachers will enhance their professional role by making technology an integral part of their teaching strategy. Application of technology in teaching will provide their students with a learning tool adaptable to various learning styles so that students at all levels may learn successfully.

Further, teachers will be able to use their new computer skills to help develop their youngsters' writing and reading skills by implementing of a cognitive academic language learning approach. The following literature review provides a clearer understanding of what is involved in computer skills training. As will be seen, the literature reviewed supports the necessity for teachers' computer skills training from a number of standpoints.

Brunder (1988) pointed out that teacher education programs may need to address not only teachers' computer literacy skills, but also their competencies in relation to teaching and student learning. Both administrators and teachers must increase their commitment to computer use in the classroom. A classroom-based integrated technology model could be implemented. In this model computers would be used as tools that focus on both problem-solving and a

whole-language learning environment. Such a model has been shown to benefit young students (Held, Newsom, & Peiffer, 1991).

In addition, Barker (1992) suggested that the identification of values held by the teacher and the student need to be the foundation of a solution strategy. That is, common values include the importance of computer knowledge and versatility, how these will benefit students currently and in the future, and how students presently observe computer applications at home and in the world around them. Rust (1992) stated that integrated technology can become the tool to assist students in developing an educational foundation. Most important, however, is the characteristic of the computer, as transmitted by the teacher, to motivate and engage young people. Such motivation is transmitted by the teacher who is literate in and comfortable with computer skills.

The educational system must view change through a child's eyes, Drucker (1992) asserted. Books are adult-friendly, and computers are child-friendly. Certainly the prevalence and popularity of video games supports this dichotomy; children seem to take naturally to the computer. In school, though, the differing viewpoints toward books and computers must yield to emphasis on their

relationship for both students and teachers, and an integration of the two divergent outlooks must take place. As a first step, instruction in word processing for teachers so that they are able to create a printed document (or a "book") is one strategy to effect such integration.

What is taught in the classroom must have a real-world link, as Kucer (1991) pointed out, rather than drill and practice of isolated skills. Thus, emphasis on practical application for students in their educational careers is a necessary component for teachers in mastering computer literacy. Further, Esfahani (1989) noted that the use of computers can enable teachers to meet the different needs evidenced by students with different learning styles. Such differentiation has definite application to limited-English-proficient students.

Thus, educational researchers and observers agree that the computer should be used within the classroom as a tool by both teacher and students. Instruction should be focused on simulations of real-world problems, indicating to students how they can be aided at every stage of learning. In accordance with students' different learning styles, teachers in instruction should present different

software alternatives for performance of the same task, incorporating curriculum content, problem-solving skills, and thinking strategies.

Description of Selected Solutions

In the implementation of the practicum several strategies were utilized which were selected as solutions to address the problem that bilingual (Spanish-English) kindergarten teachers have no basic word processing skills. Prior to implementation, a specific population of kindergarten teachers was surveyed and targeted for implementation of the practicum.

The following solutions were selected:

1. The writer developed a practical computer technology instructional unit designed to teach bilingual kindergarten teachers basic word processing skills. This unit was designed to address specifically this population in this work setting, to meet the teachers at the necessary elementary level, and to communicate with them also as necessary in Spanish, in which the writer is fluent.

2. The writer instructed the teachers in the use of computer skills so they produced one or more school-related documents in Spanish and English.

3. The writer provided instruction in the range of educational software available to teachers for various instructional goals.

4. The writer instructed teachers in basic computer maintenance, care, and troubleshooting. He also provided technological services to teachers as part of the instructional unit.

5. The writer encouraged teachers to express their misgivings and fears about the use of computers in education and supported them in their abilities to master computer skills.

Report of Action Taken

Prior to implementation, although not discussed as part of the solution strategy, the writer conducted extensive research to develop material for use in the development of the instructional unit for teaching bilingual kindergarten teachers basic word processing skills. The writer consulted with other teachers to determine appropriate teaching materials to be included in the implementation of the practicum. The writer also conducted electronic searches in various

libraries, including the Nova Southeastern University library, for new techniques and tools that could help the teachers with the range of skills to be addressed. These included teachers' own writing skills, their lesson planning preparation, and creation of practical school-related documents, such as classroom schedules, classroom rules, awards, letters to parents, and access of statistical data with their newly developed word processing skills.

The Practicum Implementation Manual

Further, the writer produced from his own experience and from the recommendations of other computer teachers a practicum implementation manual to be used as a class study guide in the implementation of this practicum. The writer created this practicum implementation manual and administered the successive stages of writing, proofreading, editing and printing to create the final version. With much effort and concentrated work, he insured that this manual was ready for the first day of class. Each student received a copy to be used as both a course guide and study reference resource.

The manual included the course description, rationale, goals, objectives, course requirements, course content, teaching strategy, evaluation methods, resources, and instructional material to be used.

Included also was a brief history of the development of the computer. Special sections were dedicated to responding to basic concerns and questions the teachers would likely have: what is a computer, types of computers, parts of a computer, how computers work, the computer's memory, telling the computer what to do, things computers can do, computers in everyday life, computers in art, computer models, computer hardware, software, and peripherals. In addition, the history and description of word processing was included, as well as information on the different word processors on the market, including the names of the most important companies that write educational software and the most important hardware manufacturing companies. A bibliography was also included.

Most importantly, the practicum implementation manual included a complete lesson plan for each day of class, with an objective and description of the activities. Detailed step-by-step instructions to be followed were given for use of the computer system. The teachers could repeatedly refer to these instructions during practicum classes and for review. For their additional reference and review, the practicum implementation manual also contained a list of selected computer vocabulary terms and a glossary.

Although the practicum manual was not a planned activity, and it was created so that implementation could be maximally effective, use of the manual proved extremely beneficial to teachers as a source of information, a study guide, and a means of organizing their programs. The teachers appreciated the manual and verbalized their praise of it to the writer. They reported that it helped them easily understand each class objective. By following the consecutive activities, they said, they could master the concepts and complete each activity with clarity and little difficulty.

The First Month

During the implementation period the writer kept a log recording all activities. This was for the purpose of monitoring both the scheduled, sequential lessons and the teachers' progress.

On the first day of class, the teachers--who were the students--took the computer literacy skills pretest, a formative evaluation, and a test of entrance-level skills. They were introduced to the computer laboratory as an environment, as well as to Mackintosh and IBM computers and different printers.

The anticipated training computer system to be used for each student was an IBM compatible model 486DX2 Multimedia

microcomputer, 30MHZ, with 4MB of RAM and a hard disk of 110MB. The equipment had a color monitor, speakers, earphones, CD-ROM, and four shared IBM dot matrix printers. However, the writer decided not to use these printers because of their outmoded technology and tendency to present technical problems, such as paper jams, and wastes of paper and ink ribbon. As a better substitute for the implementation of the practicum, the writer selected four Hewlett Packard LaserJet 4L printers.

During the first month of implementation students were instructed to begin the computer literacy exercises. They became familiar with the DOS system environment, learned how to load a bilingual tutorial, to recognize computer system components, and to identify peripheral hardware, computer terminology, and meanings of commands.

Also during the first month of implementation, each student bought 1 box of 10 high density diskettes for individual use; students were instructed how to recognize the diskettes and use the format command. The writer had previously researched and identified a range of educational software programs; WordPerfect, version 5.1, was chosen as the most convenient word processing software, due to

its updated technology, wide use, and availability in the school.

As part of the first steps, the students identified and understood the functions of the basic parts of the computer. They also understood the roles and functions of hardware and software in computer technology.

As the writer provided instruction, per Outcome #1, the students learned how to use the program commands and how to enter data. They also learned to create, edit, and save school-related documents in Spanish and English using word processing software tools such as the bilingual spell checker and the bilingual thesaurus. In addition, they learned to insert, search, move, copy, replace, save, print, and exit the word processing program.

During the first month of implementation an unexpected event occurred. A computer virus infection called "Trojan" was detected in one computer by the Microsoft Antivirus program (MSAV) installed in that particular station. A "Trojan" or "Trojan Horse" is either a vehicle to transmit a virus into a computer system, or a self-contained destructive program. Like the ancient Greeks who were supposed to have captured the city of Troy by pulling a huge wooden horse full of armed soldiers just outside the gates, pulling such a program into a

computer system can have similar disastrous results. A disaster may not occur for months. Then, unexpectedly, one day when the computer is turned on for the first time in the morning, the hard disk is suddenly formatted by itself, and all the programs and information stored in it are erased. An infantile message (such as "Arf! Arf! Gotcha!") may then appear on the screen, and the computer completely blacks out.

The discovery of this virus gave the writer the opportunity to teach students about one of the fastest-growing problems in the microcomputer field, the introduction of viruses by antisocial users. Students learned that a virus is a small program, either stored on a disk alone or appended to an existing file called a Trojan Horse. When the file is loaded or the Trojan Horse program is run, the virus automatically loads itself into the computer's memory. Once there, it can secretly attach itself to other files or programs or store itself on any other disks run on the computer, including the hard disk.

What happens next depends on the intent of the vandal who created the virus. The virus may cause problems immediately; or it may cause them at specific intervals or under specific conditions. For example, it may count specific occurrences, such as how many times

it is copied, and then cause damage; it may access the computer's clock and cause damage on a specific date; or it may reproduce itself and then cause damage. Like a biological virus, a computer virus can infect other files and then spread from them.

The number of instances in which viruses cause damage is increasing. Once introduced, viruses are hard to detect and remove. The best defense is to use only commercial programs and not to exchange files with other users. Using a virus scan program like the Microsoft MSAV, McAfee-ViruScan, Norton, or Central Point Antivirus, will help to detect and clean different viruses from a system.

The class occurrence gave dramatic evidence to students of virus and antivirus programs. Students recognized the importance of having an automatically loading antivirus program installed in the computer when the computer is turned on. They saw the importance of using an antivirus program that stays resident in memory in case an infected diskette enters into contact with the system. This antivirus program activates the alarm to inform the computer user of presence of a virus. Students also learned how to clean a virus from the

system and became informed of the necessity to constantly update the antivirus program that detects and cleans new viruses.

Because of the importance of this subject, the writer conducted additional research and wrote and distributed an addendum, a virus tutorial, for the practicum implementation manual. Students met in groups of three to discuss this unexpected event. Based on their new knowledge and the experiences they had just lived through, they evolved various creative strategies to be used in the future.

The Second Month

During the second month of implementation, in which students created a school-related document, per Outcome #2, the writer realized that printer strategy had to be altered. The original printers were to have been IBM dot matrix, but as discussed above these were replaced by laser printers. Thus, printer software installation, toner selection, instructions, care, maintenance, and troubleshooting for the laser printer had to be incorporated. This technology deserved a special section in the practicum implementation manual, and a lecture was dedicated to explanation of the technology, care of printers, change of toner, classes of fonts, and benefits of various procedures.

During this time, students worked in groups of two and created certificates of children's progress to be given to parents, announcements to parents of children's accomplishments, greeting cards, and antidrug school campaign posters. Practicum students then combined text and graphics and printed their documents, using their high-quality laser printers.

The Third Month

During the third month of implementation, as per Outcome #3, the writer demonstrated to the students the different educational software packages available to them for various instructional goals and levels. The writer also encouraged the students to make use of the broad range of educational programs in different subjects and different levels of instruction. To this end, he provided them with a handout listing and describing software, including evaluation forms for their own use.

Students were given the opportunity to read directions about the software and to discuss in groups of three appropriate kindergarten educational software to be used in the near future. They also discussed any special needs they might have and applicability of particular software. Further, students practiced using

the educational programs, loading and running them by operating their computers, following the "power up" and "power down" sequence, and executing the preloaded programs.

As per Outcome #4, students learned proper user responsibility and techniques for care and maintenance in operating a computer system. The writer gave special emphasis to the legal and ethical aspects of computer operation, including duplication of programs, as well as the care, maintenance, and handling of hardware and software. Also, students learned how to recognize strange signals or noises, their possible causes, and ways to correct them. Practical tips were introduced as well, such as how to visually recognize if a diskette is high or low density, and how to use the correct formula to format diskettes according to their capacity.

Practical diskette care recommendations were also covered, such as not exposing the diskettes to very high or very low temperatures; avoidance of touching the recording surface with the fingers or any other object; and writing on a label already on the diskette with a ball point pen or sharp pencil only. Further preservation hints concerning diskettes were offered: care not to bend the diskette, spill coffee or other liquid on it, overheat it (by leaving it

in the hot sun inside a car, for example), or expose the diskette to stray magnetic fields from a computer monitor, telephone, or speaker.

Toward the end of the third month of the implementation period, also as per Outcome #4, the writer instructed teachers in greater detail on basic computer preventive maintenance, care, and troubleshooting. Using an old computer, the writer showed the students how to use a screwdriver and open up a computer to examine the physical components inside the machine. Each student had the opportunity to experience "hands on" a memory circuit chip, a mother board, an internal modem, and a hard disk. They spent considerable time looking at, touching, and exploring the internal processing unit and asking questions that reinforced the theory and principles they had acquired.

The students learned that actual installation of any internal component is only a matter of opening up the computer and plugging in a circuit board, such as the internal modem (necessary for telecommunications), into a slot inside the computer cabinet. Students saw how relatively simple it was to disassemble and assemble a computer and to connect the monitor and the printer. These lessons consolidated their learning, reinforced their

self-confidence, and dissipated any possible fears of hands-on troubleshooting.

These activities also prepared the way for Outcome #5. Building on students' newly-gained familiarity with the computer's inner workings, in further preparation for Outcome #5 the writer created a calm, friendly learning atmosphere in which he emphasized that the computer was merely a tool. Touching or using it would not damage it or cause harm to the students themselves or the children they taught.

When the writer interviewed the students, he encouraged them to express their misgivings and fears about the use of computers in education and their abilities to master computer skills. As per Outcome #5, students eagerly shared with the writer that this instruction had been very valuable to them and, because of it, they had considerably reduced or eliminated their fears of computers. They felt much more comfortable in using and teaching with the computer in their classrooms.

By the end of the third month of implementation the students completed the programmed activities with their computer systems. They gained sufficient experience with a word processor, as well as

with cooperative learning groups, and attained mastery and a degree of comfort with the basic computer skills. An evaluation of the practicum was made, and the students completed the posttest of the summative practicum training.

Concluding Activities

As a means of additionally consolidating the students' learning and building upon their newfound confidence, the writer extended his services to familiarize them with the computer systems in their classrooms. He also offered to provide technological services to the students in the design and development of programs that would benefit their classes and enhance their classroom management.

Further, the writer designed a home assignment to be completed by the students for the purpose of using their new skills. The assignment directed them to design their "dream" computer system appropriate to their individualized needs, goals, and objectives for the classes and children they taught. An accompanying list was provided of hardware and software components appropriate for use as teaching tools, as well as price lists and newspaper adds for information and training in budget preparation.

Finally, dissemination of the practicum implementation and results began to occur as the third month ended, partly because students spoke so enthusiastically about it. The writer received requests from other computer teachers for copies of the practicum implementation manual. The writer was also invited to meet with the department chairperson and manager of the computer labs to share the nature of the practicum implementation and copies of the manual. Students' comments had apparently reached them, and, after hearing the writer's report, both the chair and manager gave highly favorable feedback.

CHAPTER V

RESULTS, DISCUSSION, AND RECOMMENDATIONS

Results

The problem addressed by this practicum was that bilingual (Spanish-English) kindergarten teachers did not know how to use computer word processing programs. Both the literature and experiential observations supported the necessity for bilingual kindergarten teachers to acquire basic computer skills to succeed as effective teachers, and to properly prepare their students to succeed in an increasing technological environment. Preliminary strategies included identifying a population of 12 bilingual kindergarten teachers who had no previous computer training, who did not know how to use word processing, and who were apprehensive about using computers (Appendix A). Moreover, these 12 teachers were neither familiar with educational computer programs nor had access to a computer laboratory.

Solution strategies were comprised of the design and implementation by the writer, a bilingual instructor in computer

literacy, of a comprehensive training program in basic computer skills. Planned components of the solution included encouragement of the teachers' new computer skills for use in their classrooms. Specifically, with computers the teachers would help develop their kindergarten students' writing and reading skills in implementation of a cognitive academic language learning approach. Also, to address the kindergarten students' different learning styles, the practicum instruction included presentation of different software alternatives for performance of the same task, incorporating curriculum content, problem-solving skills, and thinking strategies. Further, teachers would be able to use their new computer skills not only in teaching but also in classroom management.

At the end of the 3-month practicum implementation period, 12 out of 12 bilingual kindergarten teachers had mastered basic computer skills. They knew how to use computer word processing programs, as demonstrated by a number of evaluative instruments and samples of their work (Appendices B-I). The teachers also felt comfortable using the computer and bringing its applications into their classrooms. The practicum implementation thus fulfilled the desired outcomes.

Expected Outcomes

Outcome #1. The first expected outcome of the practicum was that 10 out of 12 bilingual kindergarten teachers would demonstrate their ability to recognize different computer components in the mastery of basic word processing skills. Data were collected and analyzed from the Computer Literacy Pretest (Appendix B) and Basic Computer Literacy Evaluation Instrument (Appendix C) at the beginning of the implementation and the Computer Literacy Posttest (Appendix B) at the end. These analyses showed that 12 out of 12 participants in the practicum implementation successfully achieved this goal, as illustrated in Tables 2 and 3.

Outcome #2. The second outcome of the practicum was that at least 10 out of 12 bilingual kindergarten teachers would be able to create one or more documents, with graphics, in English and Spanish, by the use of a word processing program. The measurement of this outcome was through a Letter Evaluation Instrument and the School-Related Documents Evaluation Instrument (Appendices D and E). Following implementation of the practicum, an analysis of the evaluation instruments indicated that 12 out of 12 participants had met this goal, as illustrated in Tables 4 and 5.

Table 2

Results of Teachers' Abilities to Identify Different Computer Components and Correctly Use Functions (N = 12)

Item		Yes	No
1.	Turn computer On/Off	12	0
2.	Turn peripherals On/Off	12	0
3.	Load a bilingual word processing program	12	0
4.	Write and save work	12	0
5.	Name documents	12	0
6.	Retrieve a document	12	0
7.	Print a document	12	0
8.	Retrieve and use graphics	12	0
9.	Draw and color graphics	12	0
10.	Use the English/Spanish speller	12	0
11.	Use the English /Spanish thesaurus	12	0
12.	Use electronic dictionaries	12	0
13.	Load an educational program	12	0

(table continues)

Table 2 (Continued)

Item	Yes	No
14. Use sound and video	12	0
15. Perform basic preventive maintenance	12	0
16. Perform basic troubleshooting	12	0
17. Perform basic educational software use	12	0

Table 3

Results of Teachers' Abilities in Basic Computer Literacy (N = 12)

Item		Yes	No
1.	Recognize the function of a disk drive	12	0
2.	Differentiate between a computer monitor and a television	12	0
3.	Tell what hardware is	12	0
4.	Identify the need for a disk drive	12	0
5.	Give information regarding output devices	12	0
6.	Identify the similarity between a disk drive and a cassette player	12	0
7.	Locate the computer components	12	0
8.	Differentiate between hardware and software	12	0

Table 4

Results of Teachers' Abilities to Write a Letter Correctly Using a Word Processing Program (N = 12)

Item		Yes	No
1.	Boot up the computer	12	0
2.	Load the word processing program	12	0
3.	Use margins and spaces	12	0
4.	Use automatic date	12	0
5.	Write a complete letter in two languages	12	0
6.	Use the speller, dictionaries, and thesaurus	12	0
7.	Indent, use bold, underlining, and different fonts	12	0
8.	Save, print, and exit the program	12	0

Table 5

Results of Teachers' Abilities to Create School-Related Documents (N = 12)

Item		Yes	No
1.	Use the appropriate page format	12	0
2.	Use the appropriate fonts combination	12	0
3.	Use borders and lines	12	0
4.	Use the commands to retrieve graphics	12	0
5.	Create a center masthead	12	0
6.	Format the masthead and headlines	12	0
7.	Use and save the text, graphics, and illustrated document	12	0
8.	Show creativity	12	0
9.	Show originality	12	0
10.	Show appropriateness and aesthetics	12	0

In addition, in written personal comments to the writer, participants observed that their knowledge had increased, they had developed new writing skills, they had improved their ability to type on the computer keyboard, and they had expanded their fluency in and communication of their ideas in both languages. Thus, this outcome was successfully achieved.

Outcome #3. The third outcome of the practicum was that 10 out of 12 bilingual kindergarten teachers would become familiar with the range of educational software available to them for classroom use. The measurement of this outcome was by the Educational Software Evaluation Instrument (Appendix F). Analysis of this measure at the end of implementation, in which 12 out of 12 teachers evidenced familiarity, showed the successful achievement of this outcome, as illustrated in Table 6.

Outcome #4. The fourth outcome of the practicum was that 10 out of 12 bilingual kindergarten teachers would be able to perform basic computer preventive maintenance and troubleshooting. This outcome was measured by the Computer Care and Maintenance Evaluation Instrument (Appendix G). Again, 12 out of 12 teachers demonstrated this ability, as shown by analysis of the measurement

Table 6

Results of Teachers' Abilities to Correctly Use Educational Software (N =12)

Item		Yes	No
1.	Recognize different application software packages	12	0
2.	Use the software for an educational guide book	12	0
3.	Categorize the software according to subject area	12	0
4.	Read and use the printed documentation	12	0
5.	Use compatibility and memory requirements criteria	12	0
5.	Load the program	12	0
6.	Understand the menu-driven concept	12	0
7.	Understand the interactive drill and practice concepts	12	0
8.	Use color and sound	12	0
9.	Provide comments and suggestions after using the program	12	0

document at the end of the practicum implementation period, and illustrated in Table 7. This outcome was thus successfully achieved.

Outcome #5. The fifth outcome of the practicum was that 10 out of 12 bilingual kindergarten teachers would master and feel comfortable using and teaching the use of the computer in their classrooms. This outcome was measured by the Teacher Reaction Form (Appendix H). By participants' positive reactions, the results of this measurement instrument at the end of the practicum implementation period demonstrated that 12 out of 12 teachers achieved success in this outcome. As illustrated in Table 8, all felt comfortable using a word processor. Teachers were also definitive about the activities they liked most and least, with distinctive reasons for their least favorite activities, and none suggested change in or addition of any activity. This feedback will aid the writer in future refinement of this implementation.

Unexpected Outcomes

The creation of the practicum implementation manual added unexpected outcomes for both the writer and the students. The writer gained experience in the processes and steps of idea

Table 7

Results of Teachers' Abilities to Perform Computer Care and Maintenance (N = 12)

Item		Yes	No
1.	Understand and follow the rules and regulations using computer systems	12	0
2.	Understand and describe the consequences of "proper computer behavior" in a computer room	12	0
3.	Recognize different error messages	12	0
4.	Use the correct format command	12	0
5.	Install and use an antivirus program	12	0
6.	Install and use the mouse	12	0
7.	Perform routine drivers and peripherals cleaning	12	0
8.	Perform routine paper supply, ink cartridge change, and cleaning operation for different printers	12	0
9.	Use troubleshooting manufacturers' manuals	12	0

Table 8

Results of Teachers' Reaction Form (N = 12)

Activity		Number
1.	Favorite Activity:	
	a. Computer literacy	1
	b. School letter	7
	c. School documents with graphics	2
	d. Loading and running educational programs	1
	e. Computer care and responsible use	1
2.	Least Favorite Activity:	
	a. Computer literacy	1
	b. School letter	1
	c. School documents with graphics	2
	d. Loading and running educational programs	4
	e. Computer care and responsible use	4
3.	Dislike about activity:	
	a. Remember too much	8
	b. Not enough graphics	2
	c. Steps confusing	0
	d. Do not like mechanics	2

		Yes	No
4.	Comfortable using a word processor	12	0
5.	Change any activity	0	12

conception, research, organization, writing, editing, proofreading, and printing. He also acquired experience in creating addenda, since it later became necessary to supply additional information as the practicum implementation developed.

The students gained experience in using this manual as a total sourcebook. The manual provided needed structure and direction on a daily basis. Each student used the manual as a complete course information guide: it included the course description, rationale, goals, objectives, course requirements, course content, teaching strategy, evaluation methods, resources, and instructional materials to be used. The students used the manual for daily organization. A complete lesson plan for each day of class was provided, with the objective and description of the activities for that day included, as well as detailed step-by-step instructions to be followed for using the computer system.

Also provided was study reference material covering the topics of the implementation and supplying additional information. This material was not dealt with in class but was necessary to round out and complement the training. Form both verbal and with written comments, students found the integration of the teaching and the

detailed, organized manual immensely helpful in carrying out the daily lessons.

Another unexpected outcome of the practicum experience was the writer's opportunity to teach the students about computer viruses, an unfortunately growing necessity. As described earlier, the writer introduced into the practicum implementation manual a section dedicated to computer viruses, giving the history, information, precautions, and solutions. This was immediately necessary because a virus was found in one of the computers in use and threatened to endanger the entire system--and the practicum.

Because of the importance of the subject, the writer researched and wrote an extensive addendum to the practicum implementation manual. This dealt with many aspects of viruses, including virus definitions, how viruses spread through systems, damages, differences, classes, technical protection from viruses, nontechnical defenses, recovery from a viral attack, laws against viruses, risk analysis, epidemiology of computer viruses, strategies and tactics in virus defense, and bibliography. Again the writer learned much from this experience in both information and skill, but students also learned

about the real-world risks and precautions involved in the use of computers.

Discussion

Many learning opportunities were provided for the writer throughout the implementation of the practicum. Above all, he thoroughly enjoyed the implementation phase of this practicum. It was truly an adventure as he experienced a variety of problems which, as with the virus, eventually became important occasions to enhance his skills and add meaning and import for the students. The writing, revisions, and additions to the practicum implementation manual became part of his daily life, and he found himself constantly improving and refining the manual.

Major challenges were faced in dealing with the design of a program and teaching materials that would train educators how to use computers and develop word processing skills, especially for individuals who had no previous experience with computers. Further, the time period was very short, the participants were afraid of computers, and they had many other pressing obligations that could easily take precedence over their practicum training. However, these

challenges were met by both students and instructor, and the writer views the entire practicum as a worthwhile experience that brought great personal satisfaction during implementation as well as after the final results were analyzed.

Comparison with the Literature

Results of the practicum and successes of outcomes and related discoveries for the most part supported findings from the literature. For example, several scholars noted the lack of teacher training as a major reason for little or no computer use in classrooms (Atwell, 1985; Berliner, 1985; McCarthy, 1988). Results of the initial Faculty Survey Questionnaire (Appendix A and Table 1) certainly bore out this observation. The need for teachers to possess computer literacy, as part of a reorientation to and implementation of teaching methods, was pointed out by Brunder (1988). The teachers in the present practicum recognized their own needs for computer literacy. This was demonstrated by their willingness to learn, enthusiasm in completing all assignments, and successfully achieving all designated outcomes.

Especially with regard to bilingual crosscultural educators, Swett (1986) concluded that mastery of basic computer skills would

enhance teaching strategies and provide students with learning tools. The successful results of Outcomes #1, #2, and #3, demonstrated the accuracy of this observation. Teachers mastered basic word processing skills, created school-related documents in Spanish and English with graphics, and learned about availability and application of educational software to their curricula. In fact, they expressed great intention to continue searching for new materials as they became available.

As teachers mastered the skills and achieved Outcomes #1, #2, and #3, they saw by their own increasing bilingual facility, how computer use would enhance the learning of English for their limited-English-proficient students. This use was precisely advocated by Cohen (1989) as for more effective education of limited-English-proficient students.

Furthermore, the teachers' new enthusiasm for the computer would now be transmitted to the students to motivate and engage them. This, as Rust (1992) observed, is crucial in aiding students to apply computer use to classroom situations of any type. In addition, the teachers' demonstration of their computer skills by creating a written, school-related document showed their integration of the

adult-friendly world of books and the computer-friendly world of children. The teachers thus met Drucker's (1992) admonition that the educational system must view change and its implementation through a child's eyes. Through such integration, one may conjecture that both teacher and children will then become more adept and inventive in expanding computer applications to classroom learning.

Although Outcomes #4 and #5 were unequivocally met successfully, in which teachers learned and performed basic preventive maintenance and troubleshooting and achieved mastery and comfort with computers, the literature hardly mentioned these aspects. However, the lack of integration of computers into the curriculum and lack of curriculum integration with real-life situations were discussed by Clemens et al. (1993), Perkins (1991), and Kucer (1991). Certainly lack of maintenance skills and familiarity, as well as related "computer anxiety" would contribute to teachers not wanting to integrate computers into the classroom or student life. Kucer (1991) emphasized the need for a link between classroom subjects and the real world for students. As a result of this practicum, Kucer's (1991) directive would likely be met. Computer mastery and maintenance by the teacher would become a model for students'

practical applications to their own real worlds as they learned expanding uses for the computer in their educational careers.

With reference particularly to bilingual teachers and students, Milk and Mendiola-Burges (1986) addressed special needs in the introduction of computers for bilingual education. These included recommendations for the full range of competencies, enumerating the functions of computers in the school, and preservice teacher computer anxiety. Swett (1986) also emphasized the salutary effects of computer use in the teaching of bilingual students. The observations of these researchers provided a pertinent and excellent backdrop for the design and implementation of the present practicum, in which teachers learned mastery, applications, and familiarity with computers for their daily classroom use.

Meanings of Unexpected Outcomes

Three unexpected outcomes took place, as reported in the previous chapter. These were the outcomes stemming from the manual creation by the writer, the manual experiences by the students, and the discovery of a computer virus.

For the writer, creation of the practicum manual was invaluable in developing his conceptualizing, synthesizing, delineating and

teaching skills. Whereas in the past his teaching had been responsible and responsive, it had been delivered with a large intuitive component. The manual experience forced him positively to become "consciously competent" (Peters & Waterman, 1984, p. 42), as he placed himself in the minds of the bilingual teachers, to whom the world of computers was frightening and foreign, and sought to introduce them to this world.

For the students, their experience was, they said, surprisingly pleasant and nonthreatening. They expressed appreciation for the "wraparound" nature of the combined instruction and manual, which supported and increased their learning in both speed and depth. Their worlds were indeed enlarged, and they also indicated they felt more "in tune" with contemporary society and more hopeful of keeping pace and even accelerating.

With regard to the computer virus, the writer gained much in what he felt was his responsibility and the necessity to research and add a section in the manual. Students learned equally in kind, and they possibly saw the writer as a role model in his immediate successful addressment of an unexpected event occurring during a teaching program. The students' comments indicated this insight as

well as others. Although they were at first alarmed and their fears about computers increased, as they heard the writer's lecture and read the addendum they recognized that information was the key to neutralization of a virus and mastery of the computer. They even expressed gratitude for the virus, because it had been the vehicle for teaching them so much!

Implications

The implications of both the successful results and their support and corroboration in the literature are far-reaching. First, contrary to possible erroneous stereotypical assumptions, although kindergarten teachers and other teachers may be initially afraid of computers, they do want to learn. They may have been intimidated or demoralized by complex, too-ambitious attempted courses and instructors with less than maximum patience.

Second, particular methods of instruction are necessary for successful teacher training (Perkins, 1991). As shown by the success of the manual in the practicum and the requests for it outside, a comprehensive, detailed, step-by-step curriculum guide and sourcebook seems most likely to produce the desired results and help teachers build on and expand their traditional teaching methods. The

teachers reported enjoyment of learning by means of the combined verbal instruction, manual, practical "hands-on" lessons, and groupwork. These comments imply that computer training does not have to be boring, painful, or difficult but that, especially in conjunction with group activities, can be an experience of positive learning and enhanced creativity.

Third, administrative support is crucial to the success of a teacher computer training program, as McDaniel et al. (1992) and Perkins (1991) strongly advocated. The writer was able to produce the practicum success because he had access to updated and sufficient computers and printers, the proper and comfortable physical environment, the teaching opportunity to produce the manual and design the program, and the freedom and authority to carry out the entire practicum. This all stemmed from a supportive and enthusiastic administration.

A final implication is that the entry levels of the practicum teachers may reflect the overall deficient picture in elementary education today, as the literature also implies (e.g., D'Ignazio, 1990; Perkins, 1991). That is, this country is sadly and tremendously recalcitrant in training teachers in computers and thus introducing

elementary students to their use, applications, and effectiveness in both the classroom and other areas of life.

In summary, then, all five of the outcomes anticipated for this practicum were met by the solution strategies chosen and supported in general by the literature. Discussed also were particular significant meanings of expected and unexpected outcomes, as well as broader implications for the training of teachers in computer skills.

The practicum was instrumental in developing self-confidence in the participants; computer literacy was gained, enhanced, and multiplied; interpersonal relations were fostered; pertinent information, insights, and discoveries were exchanged; and an in-depth and enjoyable learning experience took place. On the basis of these outcomes, certain recommendations can be made.

Recommendations

1. The writer recommends implementation of computer training classes for teachers by means of a district-wide spectrum. This perspective will encompass the use of computer networks and take advantage of their capabilities, with the purposes of sharing resources and decreasing costs.

2. The writer strongly supports the idea of placing a computer in the hands of every trained classroom teacher as a top educational priority, and as soon as feasible in each school. The concomitant implementation of continuous training sessions is also recommended for the most effective use of the new technologies.

3. Every teacher should have ample access to computer laboratories, with flexible hours at low or no cost. Such access is a prime necessity for the requisite practice so teachers may consolidate learning from their training programs.

4. Administrators should be informed of and attend workshops, lectures, and sample training sessions, given by instructors such as the writer. These would inform administrators of the extensive applicability of computer training for teachers, as well as reemphasize the urgency of comprehensive computer training.

5. Finally, it must be noted that these recommendations are being implemented in the writer's work setting. This is taking place because of the writer's refinement of the practicum manual to increase implementation of the program, informal sharing of information by the writer with faculty and staff, and a formal request and sample syllabus delivered to the administration for a

continuously-offered training program to instruct teachers in computer skills. Further, on conclusion of the practicum, the students volunteered to submit letters of appreciation to the administration. Students created these letters on their computers, with graphics, in both Spanish and English. These physical documents themselves were ample testimony to the success of the practicum.

Dissemination

The writer plans to disseminate the results of the practicum in several ways. Following from the initial dissemination at the end of the third month, reported above, the writer will network with the colleagues who were invited to observe the implementation phase and showed interest in the final results. He will solicit their comments and constructive input and offer to speak to their classes informally. These presentations will address the problems of computer illiteracy among teachers and report on the practicum solution strategies and results.

The writer also plans to offer basic computer education to additional classes of schoolteachers through his college and in surrounding elementary schools. In these programs, after individual

consultation with school representatives, he will present customized designs but will utilize the same practicum approach.

Finally, the writer plans to submit a condensed version of this practicum report and the results to the Nova Southeastern University Application of Technology to Education and Training (APTEC) journal. He believes strongly that, because of the successful outcomes, dissemination is warranted of both results and the methods used, including the practicum manual. Dissemination will undoubtedly prove beneficial to teachers and to the field of educational technology and training. Ultimately and most importantly, dissemination and additional implementation of this practicum will benefit the children who are taught in our schools.

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APPENDIX A

FACULTY SURVEY QUESTIONNAIRE

Appendix A

FACULTY SURVEY QUESTIONNAIRE

Name_____

Date_____

1. What grade level do you teach?_____
2. Average number of students in your classes Age_____
3. How many years of teaching experience do you have?_____

Please respond with Yes or No:

4. Are you a bilingual teacher?_____
5. Did you become a teacher outside the United States?_____
6. Do you feel comfortable using modern technology?_____
7. Have you received basic computer training?_____
8. Did you take college computer classes?_____
9. Do you know how to use a computer word processing program?
10. Are you familiar with educational computer programs?_____
11. Would you use the computer as a teaching tool?_____
12. Do you have computers in your classroom?_____
13. Do you have access to the computer lab?_____
14. Do you believe in using computers in education?_____
15. Is the school offering training for faculty members?_____
16. Do you need basic computer technology training?_____

APPENDIX B
COMPUTER LITERACY PRE/POSTTEST

Appendix B

COMPUTER LITERACY PRE/POSTTEST

Name_____

Date_____

The teacher demonstrates to the instructor that he/she can:

1. Turn On/Off computer

   Yes_____No____

2. Turn On/Off peripherals

   Yes_____No____

3. Load a bilingual word processing program

   Yes_____No____

4. Write and save work

   Yes_____No____

5. Name documents

   Yes_____No____

6. Retrieve a document

   Yes_____No____

7. Print a document

   Yes_____No____

8. Retrieve and use graphics

   Yes_____No____

9. Draw and color graphics

   Yes_____No____

10. Use the English/Spanish speller

    Yes_____No____

Appendix B

COMPUTER LITERACY PRE/POSTTEST (Continued)

Name_____

Date_____

11. Use the English/Spanish thesaurus

    Yes_____No_____

12. Use electronic dictionaries

    Yes_____No_____

13. Load an educational program

    Yes_____ No_____

14. Use sound and video

    Yes_____No_____

15. Perform basic preventive maintenance

    Yes_____No_____

16. Perform basic troubleshooting

    Yes_____No_____

17. Perform basic educational software use

    Yes_____No_____

APPENDIX C

BASIC COMPUTER LITERACY EVALUATION INSTRUMENT

Appendix C

BASIC COMPUTER LITERACY EVALUATION INSTRUMENT

Name_____

Date_____

1. Did the teacher recognize the function of a disk drive?

   Yes_____No_____

2. Can the teacher differentiate between a computer monitor and a television?

   Yes_____No_____

3. Did the teacher tell what hardware is?

   Yes_____No_____

4. Did the teacher identify the need for a disk drive?

   Yes_____No_____

5. Did the teacher give the information regarding output devices?

   Yes_____ No_____

6. Did the teacher identify the similarity between a disk drive and a cassette player?

   Yes_____No_____

7. Was the teacher able to locate the computer components?

   Yes_____No_____

8. Did the teacher differentiate between hardware and software?

   Yes_____No_____

APPENDIX D
LETTER EVALUATION INSTRUMENT

Appendix D

LETTER EVALUATION INSTRUMENT

Name_____

Date_____

1. Did the teacher boot up the computer correctly?

   Yes_____No_____

2. Did the teacher load the word processing program correctly?

   Yes_____No_____

3. Did the teacher use margins and spaces correctly?

   Yes_____No_____

4. Did the teacher use automatic date?

   Yes_____No_____

5. Did the teacher write a complete letter in two languages?

   Yes_____No_____

6. Did the teacher use the speller, dictionaries, and thesaurus?

   Yes_____No_____

7. Did the teacher indent, use bold, underlining, and different fonts?

   Yes_____No_____

8. Did the teacher save, print, and exit the program correctly?

   Yes_____No_____

APPENDIX E
SCHOOL-RELATED DOCUMENTS EVALUATION INSTRUMENT

Appendix E

SCHOOL-RELATED DOCUMENTS EVALUATION INSTRUMENT

Name_____

Date_____

1. Did the teacher use the appropriate page format?

   Yes_____No_____

2. Did the teacher use the appropriate fonts combination?

   Yes_____No_____

3. Did the teacher use borders and lines?

   Yes_____No_____

4. Did the teacher properly use the commands to retrieve graphics?

   Yes_____No_____

5. Did the teacher create a center masthead?

   Yes_____No_____

6. Did the teacher properly format the masthead and headlines?

   Yes_____No_____

7. Did the teacher properly use and save the text, graphics, and illustrated document?

   Yes_____No_____

8. Did the teacher show creativity?

   Yes_____No_____

9. Did the teacher show originality?

   Yes_____No_____

10. Did the teacher show appropriateness and aesthetics?

    Yes_____No_____

APPENDIX F
EDUCATIONAL SOFTWARE EVALUATION INSTRUMENT

Appendix F

EDUCATIONAL SOFTWARE EVALUATION INSTRUMENT

Name_____

Date_____

1. Did the teacher recognize different application software packages?

   Yes_____No_____

2. Did the teacher use the software for an educational guide book?

   Yes_____No_____

3. Did the teacher categorize the software according to subject area?

   Yes_____No_____

4. Did the teacher read and use the printed documentation?

   Yes_____No_____

5. Did the teacher use compatibility and memory requirements criteria?

   Yes_____No_____

5. Did the teacher load the program correctly?

   Yes_____No_____

6. Did the teacher understand the menu-driven concept?

   Yes_____No_____

7. Did the teacher understand the interactive drill and practice concepts?

   Yes_____No_____

8. Did the teacher use color and sound?

   Yes_____No_____

9. Did the teacher provide comments and suggestions after using the program?

   Yes_____No_____

APPENDIX G

COMPUTER CARE AND MAINTENANCE EVALUATION INSTRUMENT

Appendix G

COMPUTER CARE AND MAINTENANCE EVALUATION INSTRUMENT

Name_____

Date_____

1. Did the teacher understand and follow the rules and regulations using computer systems?

   Yes_____No_____

2. Did the teacher understand and describe the consequences of "proper computer behavior" in a computer room?

   Yes_____No_____

3. Did the teacher recognize different error messages?

   Yes_____No_____

4. Did the teacher use the correct format command?

   Yes_____No_____

5. Did the teacher install and use an antivirus program?

   Yes_____No_____

6. Did the teacher install and use the mouse?

   Yes_____No_____

7. Did the teacher perform routine drivers and peripherals cleaning?

   Yes_____No_____

8. Did the teacher perform routine paper supply, ink cartridge change, and cleaning operation for different printers?

   Yes_____No_____

9. Did the teacher use troubleshooting manufacturers' manuals?

   Yes_____No_____

APPENDIX H
TEACHER REACTION FORM

Appendix H

TEACHER REACTION FORM

Name_____

Date_____

Which was your favorite activity?

Computer literacy_____

School letter_____

School documents with graphics_____

Loading and running educational programs_____

Computer care and responsible use_____

Why was this your favorite?_____

_____

_____

Which activity did you like the least?_____

_____

_____

What did you dislike about this activity?_____

_____

_____

Do you feel comfortable using a word processor?_____

_____

_____

How would you change any of the activities?_____

_____

_____

APPENDIX I

SAMPLES OF TEACHERS' WORK

SCHOOL DOCUMENTS

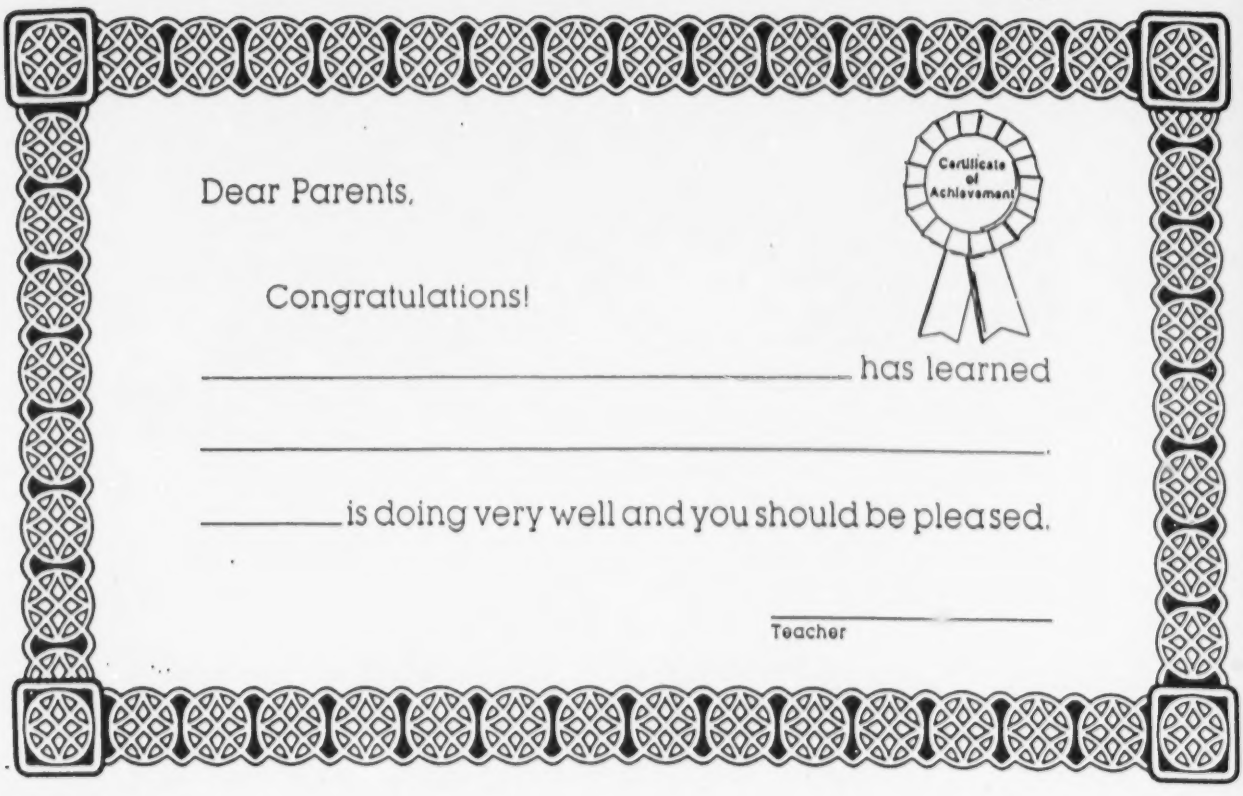
Panamerican Institute
Elementary School
Miami, Florida

TO:

Mr. Hernando Vergara, Instructor

Computer Technology
Word Processing Training

November, 1994



Dear Parents,

Congratulations!

_____ has learned

_____.

_____ is doing very well and you should be pleased.

_____
Teacher

Estimados Padres,

Felicitaciones!

_____ recibió una calificación

sobresaliente_____

_____ deben sentirse orgullosos y

satisfechos.

_____
La Maestra

Our Mission

The mission of the kindergarten teacher is to provide each child a learning environment where success is ensured, so that each child will achieve mastery of the instructional objectives commensurate with his/her grade level expectancy.

Nuestra Misión

La maestra de kindergarten tiene la misión de proveer a cada niño un ambiente propicio para que logre el aprendizaje que le permita ser una persona de bien en la vida y que pueda alcanzar los objetivos de su educación de acuerdo al nivel académico en que se encuentre.

Letters to Parents

Bilingual Correspondence

Computer Technology
Word Processing Training
November, 1994

Estimados padres:

Asignaré a los niños tareas de lunes a viernes para que las hagan en las horas de la noche. El tiempo que deberán emplear no será mas de una hora, excluyendo el tiempo necesario en la época de exámenes.

Corregiré todas las tareas. Yo estoy convencida que la motivación en el hogar, ayuda a los niños a crear buenos hábitos en el estudio. Yo por mi parte, estimularé y premiaré en la escuela a los niños que hagan bien sus tareas.

Creo firmemente que los padres desempeñan un papel muy importante para que las tareas escolares sean una experiencia practica para sus hijos. Debido a lo anterior le solicito muy cordialmente a los padres de familia que las tareas de sus hijos sean una prioridad máxima, que ustedes les suministren los elementos necesarios, que los niños encuentren un ambiente tranquilo en el hogar y que se fijen un horario para hacer las tareas. Por favor, eviten que sus hijos dejen de hacer las tareas por ningún motivo y no duden en llamarme en caso de presentarse algún problema.

Por favor, lea y comente con su hijo este reglamento relacionado con las tareas escolares. Luego, firme y devuelva esta carta a la escuela.

Trabajemos juntos por el bien de su hijo!

_____

Firma/Maestra

Letters to Parents

Bilingual Correspondence

Computer Technology
Word Processing Training
November, 1994

Dear parents:

I will assign homework Monday through Thursday nights. Homework should take students no more than one hour to complete each night, not including studying tests.

I will check all homework. I strongly believe in the value positive supporting plays in motivating children to develop good study habits. I will give students praise and other incentives when they do their homework.

I feel that the parents are the key to making homework a positive experience for their children. Therefore, I ask that parents make homework a top priority, provide necessary supplies and quiet homework environment, set a daily homework time, provide praise and support, not let children avoid homework, and contact me if they notice a problem.

Please read and discuss this homework policy with your child. Then sign and return this letter to school.

We can do this--together!

_____

Signed/Teacher